CLAIMS

WE CLAIM:

1. In a generator assembly having an exciter and a main generator with a rotor, a system on the rotor for electrically coupling windings of the rotor to a plurality of DC sources on the exciter, wherein each of the DC sources has a respective first-voltage terminal and a respective second-voltage terminal, the system comprising:

a first conductive plate defining a first aperture, the first conductive plate being supported by the rotor and comprising:

a first rotor winding terminal by which the first conductive plate is electrically coupled to the windings; and

a first plurality of terminals configured to be respectively coupled to the first-voltage terminals of the DC sources; and

a second conductive plate defining a second aperture, the second conductive plate being supported by the rotor and electrically insulated from the first conductive plate, the second conductive plate comprising:

a second rotor winding terminal by which the second conductive plate is electrically coupled to the windings; and

a second plurality of terminals configured to be respectively coupled to the second-voltage terminals of the DC sources.

2. The system of claim 1, wherein the first and second conductive plates are, respectively, a first conductive ring and a second conductive ring.

3. The system of claim 2, further comprising a first insulating ring between the first conductive ring and the second conductive ring that electrically insulates the first conductive ring from the second conductive ring, wherein the first insulating ring is also supported by the rotor.

4. The system of claim 3, further comprising a second insulating ring between the first conductive ring and the rotor that electrically insulates the first conductive ring from the rotor except with respect to the windings that are electrically coupled to the first rotor winding terminal, wherein the second insulating ring is also supported by the rotor.

5. The system of claim 4, wherein the first and second conductive rings are made from metal, and the first and second insulating rings are made of a dielectric material.

6. The system of claim 4, wherein the first and second conductive rings and the first and second insulating rings are mechanically coupled to the rotor by insulating screws.

7. The system of claim 4, wherein the first conductive ring is attached with adhesive to the first and second insulating rings, and wherein the first insulating ring is further attached with adhesive to the second conductive ring.

8. The system of claim 1, wherein the first and second conductive plates are substantially triangular plates having substantially triangular apertures.

9. The system of claim 1, wherein outer perimeters of the first and second conductive plates are identical to one another and are symmetrical, and wherein the first and second apertures are identical to one another and are symmetrical.

10. The system of claim 1, wherein the first and second conductive plates have thicknesses, as measured axially along the shaft, that are identical to one another and that are constant at all locations on the plates.

11. The system of claim 1, wherein at least one of the first and second conductive plates has a thickness, as measured axially along the shaft, that varies at different locations on the at least one plate.

12. The system of claim 1, wherein the first and second rotor winding terminals are L-brackets that first protrude radially inward towards the shaft of the rotor and then protrude axially along the shaft.

13. The system of claim 12, wherein the L-brackets are coupled to the windings by brazed connections.

14. The system of claim 1, wherein each of the first plurality of terminals and each of the second plurality of terminals is a tab having a central opening for receiving a respective terminal of one of the DC power sources.

15. The system of claim 14, wherein the openings are threaded to receive the respective terminals, and wherein all of the tabs protrude radially inward inside the respective aperture toward the shaft.

16. The system of claim 14, wherein the tabs forming the first and second plurality of terminals are positioned on the first and second conductive rings so that the tabs are aligned with the terminals of the DC sources, which are at least one of diodes and rectifier circuits.

17. The system of claim 1, wherein the first plurality of terminals are spaced equidistantly around the first aperture, and second plurality of terminals are spaced equidistantly around the second aperture.

18. The system of claim 1, wherein the rotor is a four-pole rotor, the first plurality of terminals includes three terminals and the second plurality of terminals includes three terminals, so that three DC sources can be coupled by way of the first and second conductive plates to the windings.

19. A system for electrically coupling a plurality of electrical devices on a first rotating machine component with a single electrical device on a second rotating machine component, wherein the first and second rotating machine components are in axial alignment and rotate at the same speed, and wherein each of the plurality of electrical devices and the single electrical device includes a respective first terminal and a respective second terminal, the system comprising:

a first means for electrically coupling the first terminal of the single electrical device with the first terminals of the plurality of electrical devices;

a second means for electrically coupling the second terminal of the single electrical device with the second terminals of the plurality of electrical devices; and

a third means for insulating the first means from the second means;

wherein the first, second and third means are supported by at least one of the first and second rotating machine components.

20. The system of claim 19, wherein the first and second means each are conductive rings, wherein each conductive ring includes a L-bracket capable of being electrically connected with the first and second terminals of the single electrical device, respectively, wherein the first conductive ring includes three threaded tabs capable of being electrically connected with the first terminals of the plurality of electrical devices, and wherein the second conductive ring includes three threaded tabs capable of being electrically connected with the second terminals of the plurality of electrical devices.

21. In a generator assembly, a method of coupling a plurality of rectifier circuits of an exciter with windings of a rotor of a main generator so that DC power can be provided from the rectifier circuits to the windings, the method comprising:

coupling a plate assembly onto the rotor, wherein the plate assembly includes at least a first conductive plate and a second conductive plate separated from one another by an insulating layer, and wherein the first and second conductive plates respectively define first and second apertures so that the first and second conductive plates can be positioned around a shaft of the rotor;

coupling the windings to a first terminal of the first conductive plate and also to a second terminal of the second conductive plate;

positioning the exciter in proximity to the rotor;

coupling a respective first-voltage terminal of each of the rectifier circuits to a corresponding terminal on the first conductive plate; and

coupling a respective second voltage terminal of each of the rectifier circuits to a corresponding terminal on the second conductive plate.

22. The method of claim 21, wherein the coupling of the first-voltage terminals and the second-voltage terminals of the rectifier circuits to the corresponding terminals includes screwing ends of the first-voltage and second-voltage terminals into threaded holes within the corresponding terminals of the first and second conductive plates.

23. The method of clam 21, wherein the insulating layer is at least one of an insulating film and an insulating ring.

24. The method of claim 23, wherein the plate assembly further includes an additional insulating layer that is at least one of an insulating film and

an insulating ring, wherein the additional insulating layer acts to electrically insulate the first conductive plate from the rotor except for the connection between the windings and the first conductive plate, and wherein the method further comprises the step of assembling the plate assembly by assembling the conductive plates and insulating layers together.

25. A generator assembly comprising:

an exciter including an exciter stator and an exciter rotor, wherein the exciter rotor includes a plurality of DC sources each having a respective first-voltage terminal and a respective second-voltage terminal;

a shaft; and

a main generator including a main stator and a main rotor with windings, wherein the exciter rotor and the main rotor are coupled by the shaft, and wherein the main rotor includes

a first conductive plate defining a first aperture, the first conductive plate being supported by the main rotor and including a first rotor winding terminal by which the first conductive plate is electrically coupled to the windings, and a first plurality of terminals configured to be respectively coupled to the first-voltage terminals of the DC sources; and

a second conductive plate defining a second aperture, the second conductive plate being supported by the rotor and electrically insulated from the first conductive plate, the second conductive plate including a second rotor winding terminal by which the second conductive plate is electrically coupled to the windings, and a second plurality of terminals configured to be respectively coupled to the second-voltage terminals of the DC sources.